Learnsoft
ENTERPRISE TRAINING

Introduction to Computation, Modeling and Simulation

Length: ½ Day

Summary: The course will introduce the basic concepts of computation through modeling and simulation that are increasingly being used by architects, planners, and engineers to shorten design cycles, innovate new products, and evaluate designs and simulate the impacts of alternative approaches. We will use MATLAB to explore a range of programming and modeling concepts while acquiring those skills.

COURSE CONTENT

Course Objectives:

- Demonstrate basic programming skills – functions, arrays, loops, conditional statements, procedures
- Demonstrate technical communication skills: Create a comprehensive report and an oral presentation with accurate visual representations of a model and its results
- Explain the Role of Modeling: Discuss the importance of modeling to science and engineering, the history and need for modeling, the cost effectiveness of modeling, the time-effect of modeling, define the terms associated with modeling to science and engineering, list questions that would check/validate model results, describe future trends and issues in science and engineering, and identify specific industry related examples of modeling in science and engineering
- Utilize the Modeling Process to identify the key parameters of a model, estimate model outcomes, utilize a computational tool, e.g., MATLAB to implement the mathematical representation of the model, convey the results of the simulation accurately, validate the model with data, and discuss the quality and sources of errors in the model
- Construct difference-based computer models
- Explain and conduct the transforming of continuous functions and dynamics equations into discrete computer representations. Write pseudo-code for finite difference modeling equations and create a simulation in a computational tool, e.g., MATLAB